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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/567,999

02/10/2006

Masayuki Yoneda

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1933 7590 07/20/2007
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EXAMINER

JENKINS, JERMAINE L

ART UNIT

PAPER NUMBER

2855

MAIL DATE

DELIVERY MODE

07/20/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/567,999	YONEDA ET AL.	
	Examiner	Art Unit	
	Jermaine Jenkins	2855	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-7 is/are allowed.
- 6) ☒ Claim(s) 1-3 and 8 is/are rejected.
- 7) ☒ Claim(s) 4 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 & 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Drewes et al (6,267,009).

In regards to claim 1, Drewes et al teaches a pressure sensor having a thin diaphragm (8) made of brittle material (i.e. ceramic), in which a strain resistance gauge (82 & 86, i.e. third and fourth electrodes) is formed in a surface thereof (The electrodes (82 & 86) are formed on the surface of the ceramic diaphragm (8) wherein the deflection of the diaphragm will result in a change of capacitance which is directly related to a change in resistance ($C = Q/V$ wherein $V = IR$); Column 10, lines 37-61; See Figure 5.), a stopper member (3) including a concave portion (324) comprising a curved surface parallel to a surface formed by displacement of the diaphragm (8), concave portion (324) being disposed so as to face the diaphragm (8) (The substrate (3) can act as a stopper when the diaphragm deforms towards the curved portion (324); therefore, the substrate is being read as a stopper; Column 10, lines 37-44; See Figure 5).

With respect to claim 2, Drewes et al teaches further comprising another stopper member (4, i.e. second substrate) wherein the stopper members (3 & 4) are disposed so as to face respective sides of the diaphragm (8) (See Figure 5).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3 & 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drewes et al (6,267,009) in view of Onishi (6,019,135).

With respect to claims 3 & 8, Drewes et al teaches the claimed invention except for wherein the curved surface of the concave portion in stopper member is formed into a curved surface in which when the diaphragm has a radius of r , a thickness of t , and a flexural rigidity of D , depth y at a distance x from a center of said diaphragm in relation to operating pressure for protection against maximum pressure p is expressed by a quartic function:

$$y = pr^4(1 - x^2/r^2)^2/64D$$

$$D = Et^3/12(1 - \nu^2)$$

where E is Young's modulus, and ν is Poisson's ratio.

Onishi teaches a pressure sensor having a diaphragm stopper structure wherein the curved surface of the concave portion in stopper member is formed into a curved

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surface in which when the diaphragm has a radius of r , a thickness of t , and a flexural rigidity of D , depth y at a distance x from a center of said diaphragm in relation to operating pressure for protection against maximum pressure p is expressed by a quartic function:

$$y = \frac{pr^4(1-x^2/r^2)^2}{64D}$$

$$D = \frac{Et^3}{12(1-\nu^2)}$$

where E is Young's modulus, and ν is Poisson's ratio (Column 6, lines 25-40).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the quartic function as taught by Onishi into the pressure sensor of Drewes et al for the purpose of calculating when the stress on the diaphragm is relatively small or extremely high to monitor the risk of rupture of the diaphragm (Onishi; Column 6, lines 41-61).

Allowable Subject Matter

5. Claims 4 & 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not disclose or suggest wherein each of the stopper members having a lead hole for pressure transmitting medium to be led to the diaphragm in a top portion of the concave portion having the curved surface parallel to the surface formed by displacement of the diaphragm.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jermaine Jenkins whose telephone number is 571-272-2179. The examiner can normally be reached on Monday-Friday 9am-530pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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A.U. 2855



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